

Notice of Allowability

Application No.

09/668,320

Examiner

Herng-der Day

Applicant(s)

ALPERT ET AL.

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendments received 5/31/05 and 7/18/08.
2. ☒ The allowed claim(s) is/are 1-3, 7-10, 14-17, and 21-23, now renumber as 1-14.
3. ☒ The drawings filed on 5/31/05 (Fig. 2) and 7/18/05 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 07212005.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

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DETAILED ACTION

1. This communication is in response to Applicants' Amendment to Office Action dated March 23, 2005, mailed May 26, 2005, received by PTO May 31, 2005, and Applicants' Supplemental Amendment faxed July 18, 2005.

1-1. Claims 22-23 have been added. Claims 1, 7-8, 14-15, and 21-23 have been amended. Claims 4-6, 11-13, and 18-20 have been cancelled. Claims 1-3, 7-10, 14-17, and 21-23 are pending.

1-2. Claims 1-3, 7-10, 14-17, and 21-23 have been examined and allowed.

Reasons for Allowance

2. The following is an Examiner's statement of reasons for allowance:

2-1. The closest prior art of record discloses:

(1) A method of calculating the π -model and computing the interconnect delay (Alpert et al., U.S. Patent 6,347,393 B1).

(2) A method of modeling the effective capacitance (Qian et al., "Modeling the 'Effective Capacitance' for the RC Interconnect of CMOS Gates").

2-2. Independent claim 1 is directed at a computer implemented method for determining an interconnect delay at a node in an RC tree. Although determining an effective capacitance, a π -model, and an Elmore delay are obvious as disclosed in the prior art, this independent claim identifies the distinct feature of characterizing the equivalent effective capacitance by:

$$C_{eff} = C_f(1 - e^{-T/\tau_d})$$

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wherein C_{fj} is a far-end capacitance of said pi-model at said node, T is the Elmore delay at said node and τ_{dj} is a resistance of said pi-model (R_{dj}) multiplied by C_{fj} ; and utilizing said equivalent effective capacitance value to calculate said interconnect delay at said node as described in the specification at pages 14-15.

Because the closest prior art does not teach or suggest characterizing the equivalent effective capacitance by the claimed expression and utilizing said equivalent effective capacitance value to calculate the interconnect delay, claim 1 is deemed allowable.

Dependent claims 2-3 and 7 are allowable as they depend on the allowed independent claim 1.

2-3. Independent claims 8-10 and 14 are system claims including equivalent method limitations as in the allowable claims 1-3 and 7 respectively and are deemed allowable for the same reasons as claims 1-3 and 7.

2-4. Independent claims 15-17 and 21 are computer program product claims including equivalent method limitations as in the allowable claims 1-3 and 7 respectively and are deemed allowable for the same reasons as claims 1-3 and 7.

2-5. Independent claim 22 is directed at a program product comprising a computer-readable medium including program code for determining an interconnect delay at a node in an RC tree. Although determining an effective capacitance, a π -model, and an Elmore delay are obvious as disclosed in the prior art, this independent claim identifies the distinct feature of utilizing equivalent effective capacitance value to calculate said interconnect delay at said node, wherein said equivalent effective capacitance is characterized by:

$$C_{eff} = C_{fj}(1 - e^{-T/\tau_{dj}})$$

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wherein C_{fj} is a far-end capacitance of a pi-model at said node, T is an Elmore delay at said node and τ_{dj} is a resistance of said pi-model (R_{dj}) multiplied by C_{fj} as described in the specification at pages 14-15.

Because the closest prior art does not teach or suggest characterizing the equivalent effective capacitance by the claimed expression and utilizing said equivalent effective capacitance value to calculate the interconnect delay, claim 22 is deemed allowable.

Dependent claim 23 is allowable as it depends on the allowed independent claim 22.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Jean R. Homere can be reached on (571) 272-3780. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day *H.D.*
July 28, 2005

J. R. Homere
JEAN R. HOMERE
PRIMARY EXAMINER